LETTERS TO PROGRESS IN PHYSICS

Superluminal Physics and Instantaneous Physics as New Trends in Research

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In a similar way as passing from Euclidean Geometry to Non-Euclidean Geometry, we can pass from Subluminal Physics to Superluminal Physics, and further to Instantaneous Physics. In the lights of two consecutive successful CERN experiments with superluminal particles in the Fall of 2011, we believe that these two new fields of research should begin developing.

1 Introduction

Let's start by recalling the history of geometry in order to connect it with the history of physics.

Then we present the way of S-denying a law (or theory) and building a spectrum of spaces where the same physical law (or theory) has different forms, then we mention the S-multispace with its multistructure that may be used to the Unified Field Theory by employing a *multifield*.

It is believed that the S-multispace with its multistructure is the best candidate for 21st century *Theory of Everything* in any domain.

2 Geometry's history

As in Non-Euclidean Geometry, there are models that validate the hyperbolic geometric and of course invalidate the Euclidean geometry, or models that validate the elliptic geometry and in consequence they invalidate the Euclidean geometry and the hyperbolic geometry.

Now, we can mix these geometries and construct a model in which an axiom is partially validated and partially invalidated, or the axiom is only invalidated but in multiple different ways [1]. This operation produces a degree of negation of an axiom, and such geometries are hybrid. We can in general talk about the *degree of negation of a scientific entity* P, where P can be a theorem, lemma, property, theory, law, etc.

3 S-denying of a theory

Let's consider a physical space S endowed with a set of physical laws L, noted by (S, L), such that all physical laws L are valid in this space S.

Then, we construct another physical space (or model) S_1 where a given law has a different form, afterwards another space S_2 where the same law has another form, and so on until getting a spectrum of spaces where this law is different.

We thus investigate spaces where anomalies occur [2].

4 Multispace theory

In any domain of knowledge, multispace (or S-multispace) with its multistructure is a finite or infinite (countable or uncountable) union of many spaces that have various structures. The spaces may overlap [3].

The notions of multispace (also spelt multi-space) and multistructure (also spelt multi-structure) were introduced by the author in 1969 under his idea of hybrid science: combining different fields into a unifying field (in particular combinations of different geometric spaces such that at least one geometric axiom behaves differently in each such space), which is closer to our real life world since we live in a heterogeneous multispace. Today, this idea is accepted by the world of sciences. S-multispace is a qualitative notion, since it is too large and includes both metric and non-metric spaces.

A such multispace can be used for example in physics for the Unified Field Theory that tries to unite the gravitational, electromagnetic, weak and strong interactions by constructing a *multifield* formed by a gravitational field united with an electromagnetic field united with a weak-interactions field and united with a strong-interactions field.

Or in the parallel quantum computing and in the mu-bit theory, in multi-entangled states or particles and up to multi-entangles objects.

We also mention: the algebraic multispaces (multi-groups, multi-rings, multi-vector spaces, multi-operation systems and multi-manifolds, also multi-voltage graphs, multi-embedding of a graph in an n-manifold, etc.) or structures included in other structures, geometric multispaces (combinations of Euclidean and Non-Euclidean geometries into one space as in S-geometries), theoretical physics, including the Relativity Theory [4], the M-theory and the cosmology, then multi-space models for p-branes and cosmology, etc.

The multispace is an extension of the neutrosophic logic and set, which derived from neutrosophy. Neutrosophy (1995) is a generalization of dialectics in philosophy, and takes into consideration not only an entity <A> and its opposite <antiA> as dialectics does, but also the neutralities <neutA> in between. Neutrosophy combines all these three <A>, <antiA>, and <neutA> together. Neutrosophy is a metaphilosophy.

Neutrosophic logic (1995), neutrosophic set (1995), and

neutrosophic probability (1995) have, behind the classical values of truth and falsehood, a third component called indeterminacy (or neutrality, which is neither true nor false, or is both true and false simultaneously — again a combination of opposites: true and false in indeterminacy).

Neutrosophy and its derivatives are generalizations of the paradoxism (1980), which is a vanguard in literature, arts, and science, based on finding common things to opposite ideas (i.e. combination of contradictory fields).

5 Physics history and the future

a) With respect to the size of space there are: *Quantum Physics* which is referring to the subatomic space, the *Classical Physics* to our intuitive living space, while *Cosmology* to the giant universe;

b) With respect to the direct influence: the *Locality*, when an object is directly influenced by its immediate surroundings only, and the *Nonlocality*, when an object is directly influenced by another distant object without any interaction mediator;

c) With respect to the speed: the *Newtonian Physics* is referred to low speeds, the *Theory of Relativity* to subluminal speeds near to the speed of light, while *Superluminal Physics* will be referred to speeds greater than c, and *Instantaneous Physics* to instantaneous motions (infinite speeds).

A physical law has a form in Newtonian physics, another form in Relativity Theory, and different form at Superluminal theory, or at Infinite (Instantaneous) speeds — as above in the S-Denying Theory spectrum.

We get new physics at superluminal speeds and other physics at a very very big speed ($v \gg c$) speeds or at instantaneous (infinite) traveling.

At the beginning we have to extend physical laws and formulas to superluminal traveling and afterwards to instantaneous traveling.

For example, what/how would be Doppler effect if the motion of an emitting source relative to an observer is greater than c, or $v \gg c$ (much greater than c), or even at instantaneous speed?

Also, what addition rule should be used for superluminal speeds?

Then little by little we should extend existing classical physical theories from subluminal to superluminal and instantaneous traveling.

For example: if possible how would the Theory of Relativity be adjusted to superluminal speeds?

Lately we need to found a general theory that unites all theories at: law speeds, relativistic speeds, superluminal speeds, and instantaneous speeds — as in the S-Multispace Theory.

6 Conclusion

Today, with many contradictory theories, we can reconcile them by using the S-Multispace Theory.

We also propose investigating new research trends such as Superluminal Physics and Instantaneous Physics. Papers in these new fields of research should be e-mailed to the author by July 01, 2012, to be published in a collective volume.

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References

1. Linfan Mao. Automorphism groups of maps, surfaces and Smarandache geometries. arXiv: math/0505318.
2. Smarandache F. S-Denying a Theory. *Progress in Physics*, 2011, v.1, 71–74.
3. Smarandache F. Multispace and Multistructure as a Theory of Everything. *13th Annual Meeting of the Northwest Section of the APS*, Session D1, LaSells Stewart Center, Public Gallery (room), Oregon State University, Corvallis, Oregon, USA, 04:30 PM on Friday, October 21, 2011.
4. Rabounski D. Smarandache Spaces as a New Extension of the Basic Space-Time of General Relativity. *Progress in Physics*, 2010, v.2, L1–L2.